

SIEMENS

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO.: 10/797,452 CONFIRMATION NO. 4438
APPLICANT: Baghdadi et al.
FILED: March 10, 2004
GROUP ART UNIT: 3673
EXAMINER: Patel, Vishal A.
ATTORNEY DOCKET NO.: 2004P03672US

FOR: Seal for a Turbine Engine

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST TO WITHDRAW THE ASSESSMENT OF NON-COMPLIANCE

Sir:

On September 24, 2007, the Examiner indicated that a Revised Appeal Brief filed on June 29, 2007 was non-compliant and indicates that the time period set by the Office Action mailed on June 6, 2007 is still running. The Applicant hereby submits that a Second Revised Appeal Brief responsive to the second Notice of Non-Compliant Appeal Brief mailed on June 6, 2007 was filed on July 6, 2007; a copy of which is re-submitted herewith.

Serial No. 10/797,452
Atty. Doc. No. 2004P03672US

Also attached hereto is a declaration from the person who executed the Facsimile Cover Sheet for the Second Revised Appeal Brief, Barbara Quinn, confirming that she personally transmitted the responsive materials on the July 6, 2007 date indicated by the Facsimile Cover Sheet.

In light of the above, the Applicant respectfully requests reconsideration of the Examiner's assertion of non-compliance and presumes no fee is required. However, the Commissioner is hereby authorized to charge any appropriate fees due in connection with this reconsideration paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Dated: 10/8/07

Respectfully submitted,

By: 

Erik C. Swanson
Registration No. 40,194
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Siemens Corporation
Intellectual Property Department
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SIEMENS

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO.: 10/797,452 CONFIRMATION NO. 4438
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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION OF BARBARA QUINN IN SUPPORT OF
REQUEST TO WITHDRAW THE ASSESSMENT OF NON-COMPLIANCE

Sir:

I, Barbara Quinn, do hereby declare as follows:

1. I am employed as an Intellectual Property Specialist. Acting in that capacity I prepare and file documents on behalf of Siemens Power Generation, Inc.(formerly known as Siemens Westinghouse Power Corp) and other Siemens operating companies. I assist patent attorneys Erik C. Swanson and John P. Musone, who both are of record for the above-referenced patent application.

2. On July 6, 2007, prior to personally facsimile filing the Second Revised Appeal Brief signed by John P. Musone on July 6, 2007, I signed the Certificate of Transmission stating "I

hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office on July 6, 2007." I then personally facsimile filed the Second Revised Appeal Brief to the attention of Vishal A. Patel at 571-273-8300 on July 6, 2007. A *Communication Result Report* printed from our fax machine indicating that the 26 page transmission was successfully sent to the USPTO. We received back an "Auto-Reply Facsimile Transmission" from the USPTO confirming receipt of 9 pages, so I marked the Facsimile Cover Sheet with the words "Re-Sent due to Transmission error" and re-faxed the documents. Again a *Communication Result Report* printed from our fax machine indicating that the second 26 page transmission was successfully sent to the USPTO. At this time we received back an "Auto-Reply Facsimile Transmission" from the USPTO confirming receipt of 43 pages (beginning with page 10 of 26) which indicated that the remaining pages of the first facsimile sent, as well as those in the second facsimile sent, had been received (a total of 52 pages received by the USPTO).

3. I declare that all statements, made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or patent issuing therefrom.

Respectfully submitted,

Dated: 10/8/07

By: Barbara Quinn
Barbara Quinn

* * * COMMUNICATION RESULT REPORT (JUL. 6. 2007 2:51PM) * * *

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First Named Inventor: Sam Baghdadi

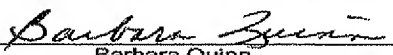
Application No. **10/797,452**

Atty. Docket No: 2004P03672US

Filed: 03/10/2004

Title: **SEAL FOR A TURBINE ENGINE**

Examiner: Vishal A. Patel

Art Unit: **3673****FACSIMILE ATTN TO: Vishal A. Patel****FAX NO.: 571-273-8300****SECOND REVISED APPEAL BRIEF**Commissioner for Patents
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SIEMENS**FACSIMILE COVER SHEET**In the UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Sam Baghdadi

Application No. 10/797,452

Atty. Docket No: 2004P03672US

Filed: 03/10/2004

Title: SEAL FOR A TURBINE ENGINE

Examiner: Vishal A. Patel

Art Unit: 3673

FACSIMILE ATTN TO: Vishal A. Patel

FAX NO.: 571-273-8300

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First Named Inventor: Sam Baghdadi

Application No. **10/797,452**

Atty. Docket No: 2004P03672US

Filed: 03/10/2004

Title: **SEAL FOR A TURBINE ENGINE**

Examiner: Vishal A. Patel

Art Unit: 3673

FACSIMILE ATTN TO: Vishal A. Patel**FAX NO.: 571-273-8300****SECOND REVISED APPEAL BRIEF**Commissioner for Patents
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JUL 6 2007 2:46:29 407-736-6440

NO. 7256 P. 13/26

U.S. Serial No. 10/797,452
SECOND REVISED Appeal Brief Dated July 6, 2007

positioned at an acute angle relative to a rotational axis (18) of the rotatable body (12) in the at least one row of blades that is generally orthogonal to the rotational axis (18) (see e.g. page 3 line 23 - page 4 line 29). The plurality of blades (16) coupled to the rotatable body (12) are positioned to direct fluids from the low pressure gas region (28) toward the high pressure gas region (30) to limit leakage of fluids from the high pressure gas region (30) proximate to the at least one row of blades (20) coupled to the stationary body (14) to the low pressure gas region (28) proximate to the at least one row of blades (16) coupled to the rotatable body (12) (see e.g. page 3 line 23 - page 4 line 29). The claimed invention is described in the specification at pages 3 and 4 and shown in Figures 1 and 2.

Claim 11 is directed to a seal (10) formed from a plurality of blades (16) extending radially from a rotatable body (12) and positioned generally nonparallel to a rotational axis (18) of the rotatable body (12), wherein the plurality of blades (16) generally form at least one row of blades and a plurality of blades (20) extending radially from a stationary body (14) towards the rotatable body (12) and positioned nonparallel to the rotational axis (18) of the rotatable body (12), wherein the plurality of blades (20) form at least one row of blades; a high pressure gas region (30) in the turbine engine that is proximate to the plurality of blades (20) extending radially from the stationary body (14) and opposite to the plurality of blades (16) extending radially from the rotatable body (12) (see e.g. page 3 line 23 - page 4 line 29). The seal (10) may include a low pressure gas region (28) in the turbine engine that is proximate to the plurality of blades (16) extending radially from the rotatable body (12) and

(WP110546;1)

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FACSIMILE COVER SHEET

In the UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Sam Baghdadi

Application No. **10/797,452**

Atty. Docket No: 2004P03672US

Filed: 03/10/2004

Title: **SEAL FOR A TURBINE ENGINE**

Examiner: Vishal A. Patel

Art Unit: **3673**

FACSIMILE ATTN TO: Vishal A. Patel

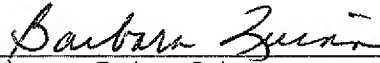
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Orlando Florida 32826

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)		Application Number	10/797,452
		Filing Date	March 10, 2004
		First Named Inventor	Sam Baghdadi
		Art Unit	3673
		Examiner Name	Vishal A. Patel
Total Number of Pages in This Submission	26	Attorney Docket Number	2004P03672US26

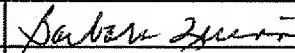
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

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Printed Name	John P. Musone		
Date	July 6, 2007	Reg. No.	44,961

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Typed or printed name	Barbara Quinn	Date	July 6, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SERIAL NO.: 10/797,452 CONFIRMATION NO. 4438

APPLICANT: **Baghdadi et al.**

FILED: February 9, 2004

GROUP ART UNIT: 3673

EXAMINER: **Patel, Vishal A.**

ATTORNEY
DOCKET NO.:

CUSTOMER NO.:

FOR: **Seal for a Turbine Engine**

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DATE: July 6, 2007

SECOND REVISED APPEAL BRIEF

Sir:

The Notification of Appeal was filed on February 26, 2007. A Notice of Non-Compliant Appeal Brief was mailed June 6, 2007 by the Primary Examiner which was responded to via the Revised Appeal Brief filed on June 29, 2007. A second Notice of Non-Compliant Appeal Brief was separately mailed June 6, 2007 by the Patent Appeals Specialist which is responded to via the instant Second Revised Appeal Brief.

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I. REAL PARTY IN INTEREST

The real party in interest in connection with the above identified patent application is Siemens Power Generation, Inc., the assignee of record.

II. RELATED APPEALS AND INTERFERENCES

There exist no related appeals or interferences in connection with the above-identified patent application.

III. STATUS OF CLAIMS

Claims 1-6, 9-16 and 19-20 were pending in this application. Claims 7, 8, 17 and 18 have been previously canceled without prejudice. Claims 1-6, 9-16 and 19-20 are being appealed.

IV. STATUS OF AMENDMENTS

No amendments were filed after issuance of the final office action dated November 21, 2006. All previous amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1 is directed to a turbine engine having a seal (10) configured to form a seal between low and high pressure regions (see e.g. page 3 lines 7-22). The seal (10) is formed from a plurality of blades (16) extending radially from a rotatable body (12) and generally forming at least one row of blades and a plurality of blades (20) extending radially from a stationary body (14) towards the rotatable body (12) and generally forming at least one row of blades (see e.g. page 3 line 23 – page 4 line 17). The seal (10) may include a high pressure gas region (30) in the turbine engine that is proximate to the plurality of blades (20) extending radially from the stationary body (14) and opposite to the plurality of blades (16) extending radially from the rotatable body (12) and a low pressure gas region (28) in the turbine engine that is proximate to the plurality of blades (16) extending radially from the rotatable body (12) and opposite to the plurality of blades (20) extending radially from the stationary body (14), wherein the low pressure region (28) has a pressure less than the high pressure region (30) (see e.g. page 3 line 23 – page 4 line 24). The plurality of blades (16) extending from the rotatable body (12) and the plurality of blades (20) extending from the stationary body (14) form the seal between the high pressure gas region (30) and the low pressure gas region (28) (see e.g. page 3 line 23 – page 4 line 29). The plurality of blades (20) extending radially from the stationary body (14) are positioned proximate to the plurality of blades (16) extending from the rotatable body (12) and are nonparallel with the plurality of blades (16) extending from the rotatable body (12) (see e.g. page 3 line 23 – page 4 line 29). The plurality of blades (20) extending radially from the stationary body (14) are

positioned at an acute angle relative to a rotational axis (18) of the rotatable body (12) in the at least one row of blades that is generally orthogonal to the rotational axis (18) (see e.g. page 3 line 23 – page 4 line 29). The plurality of blades (16) coupled to the rotatable body (12) are positioned to direct fluids from the low pressure gas region (28) toward the high pressure gas region (30) to limit leakage of fluids from the high pressure gas region (30) proximate to the at least one row of blades (20) coupled to the stationary body (14) to the low pressure gas region (28) proximate to the at least one row of blades (16) coupled to the rotatable body (12) (see e.g. page 3 line 23 – page 4 line 29). The claimed invention is described in the specification at pages 3 and 4 and shown in Figures 1 and 2.

Claim 11 is directed to a seal (10) formed from a plurality of blades (16) extending radially from a rotatable body (12) and positioned generally nonparallel to a rotational axis (18) of the rotatable body (12), wherein the plurality of blades (16) generally form at least one row of blades and a plurality of blades (20) extending radially from a stationary body (14) towards the rotatable body (12) and positioned nonparallel to the rotational axis (18) of the rotatable body (12), wherein the plurality of blades (20) form at least one row of blades; a high pressure gas region (30) in the turbine engine that is proximate to the plurality of blades (20) extending radially from the stationary body (14) and opposite to the plurality of blades (16) extending radially from the rotatable body (12) (see e.g. page 3 line 23 – page 4 line 29). The seal (10) may include a low pressure gas region (28) in the turbine engine that is proximate to the plurality of blades (16) extending radially from the rotatable body (12) and

opposite to the plurality of blades (20) extending radially from the stationary body (14), wherein the low pressure region (28) has a pressure less than the high pressure region (30). The plurality of blades (16) extending from the rotatable body (12) and the plurality of blades (20) extending from the stationary body (14) form the seal between the high pressure gas region (30) and the low pressure gas region (28) (see e.g. page 3 line 23 – page 4 line 29). The plurality of blades (20) extending radially from the stationary body (14) are positioned proximate to the plurality of blades (16) extending from the rotatable body (12) and are nonparallel with the plurality of blades (16) extending from the rotatable body (12), and the plurality of blades (20) extending radially from the stationary body (14) are positioned at an acute angle relative to a rotational axis (18) of the rotatable body (12) in the at least one row of blades that is generally orthogonal to the rotational axis (18) (see e.g. page 3 line 23 – page 4 line 29). The plurality of blades (18) coupled to the rotatable body (12) are positioned to direct fluids from the low pressure gas region (28) toward the high pressure gas region (30) to limit leakage of fluids from the high pressure gas region (30) proximate to the at least one row of blades (20) coupled to the stationary body (14) to the low pressure gas region (28) proximate to the at least one row of blades (16) coupled to the rotatable body (12) (see e.g. page 3 line 23 – page 4 line 29). The claimed invention is described in the specification at pages 3 and 4 and shown in Figures 1 and 2.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are requested to be reviewed on appeal. In particular, first, the Examiner rejected claims 1, 3-4, 9-11, 13-14 and 19-20 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 3,575,523 to *Gross* in view of United States Patent No. 6,027,306 to *Bunker*, and further in view of United States Patent No. 1,689,735 to *Losel*. Second, the Examiner rejected claims 2, 5-6, 12 and 15-16 under 35 U.S.C. § 103(a) as being unpatentable over *Gross*, *Bunker* and *Losel* and further in view of United States Patent No. 4,571,937 to *Albers*.

VII. ARGUMENTS

I. REJECTION OF CLAIMS 1, 3-4, 9-11, 13-14, AND 19-20 UNDER 35 U.S.C. § 103

The Examiner rejected claims 1, 3-4, 9-11, 13-14, and 19-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,575,532 to *Gross* in view of U.S. Patent No. 6,027,306 to *Bunker*, further in view of U.S. Patent No. 1,689,735 to *Lösel*. The Examiner stated that *Gross* and *Bunker* disclose the claimed invention but fail to disclose that the plurality of blades extending from the stationary body are positioned at an acute angle relative to a rotational axis of the rotatable body. The Examiner stated that *Lösel* discloses a stationary member having a plurality of blades that are angled at an acute angle relative to a rotational axis of a shaft. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the plurality of blades of *Gross* and *Bunker* angled at an acute angle as taught by *Lösel* to provide an effective labyrinth seal and to prolong the life of the seal.

As shown in Figure 2 and claimed in independent claims 1 and 11, the blades extending from the stationary body extend radially from the stationary body and at an acute angle. In particular, claims 1 and 11 state "a plurality of blades extending radially from a stationary body towards the rotatable body and generally forming at least one row of blades . . . and the plurality of blades extending radially from the stationary body are positioned at an acute angle relative to a rotational axis of the rotatable body in the at least one row of blades that is generally orthogonal to the rotational axis . . ." (emphasis added). Thus, the claimed

blades extend radially toward the rotational body and are positioned at an acute angle relative to a rotational axis. In sharp contrast, *Lösel* does not disclose a plurality of blades forming a single row of blades. Rather, *Lösel* discloses a plurality of single blades that each form continuous rings. Furthermore, *Lösel* does not disclose blades that extend radially toward a rotatable body and are positioned at an acute angle relative to a rotational axis. Instead, the continuous rings disclosed in *Lösel* do not extend radially toward the rotatable body. Rather, the continuous rings of *Lösel* extend at an acute angle relative to a radial axis extending from the rotational axis, as shown in Figure 2 of *Lösel*. In contrast, the claimed invention is directed to blades the project radially and at an acute angle relative to a rotational axis. Such a configuration, as shown in Figure 2 and claimed, is completely different than the configuration disclosed in *Lösel*. Thus, the blades disclosed in *Lösel* simply do not disclose the claimed structure, which is "the plurality of blades extending radially from the stationary body are positioned at an acute angle relative to a rotational axis of the rotatable body in the at least one row of blades that is generally orthogonal to the rotational axis . . ." (emphasis added).

Another way of describing the difference between the claimed invention and *Lösel* is that the intersection of the blade and the stationary support structure of *Lösel* is orthogonal to a rotational axis. The blade then extends from the intersection at an acute angle moving away from the base. In contrast, intersections of the claimed blades and the stationary support structures are not positioned orthogonal to the rotational axis; rather, the intersections of the claimed blades are positioned at an acute angle relative to the rotational

axis. The blades of the claimed invention do not extend at an acute angle from the stationary structure. Instead, the blades extend radially. Therefore, claims 1 and 11, and those claims depending therefrom, are patentable, and the Examiner is respectfully requested to withdraw the rejection.

II. REJECTION OF CLAIMS 2, 5-6, 12 AND 15-16 UNDER 35 U.S.C. § 103

The Examiner rejected claims 2, 5-6, 12 and 15-16 under 35 U.S.C. § 103(a) as being unpatentable over *Gross*, *Bunker* and *Lösel* as previously applied, and further in view of U.S. Patent No. 4,571,937 to *Albers*. The Examiner stated that *Gross* discloses the invention substantially as claimed but fails to disclose that the blades on the stationary body are annularly spaced or formed intermittently and have an angle of about 1-89 degrees. The Examiner stated that *Albers* discloses a plurality of blades on a stationary body and the blades are angled to about 1-89 degrees from a rotational axis. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the blades of *Gross* be segmented annularly or formed intermittently to provide a turbine that has substantially no efficiency losses.

Albers discloses a system for controlling the flow of leakage fluids and cooling air of a rotor proximate to a tip of a rotatable turbine blade. The system includes a plurality of blades extending radially inward from a stationary outer housing. The blades are positioned downstream of exhaust orifices in the tip of a turbine blade to direct cooling fluids exhausted from the turbine blades. The system is configured to redirect cooling fluids and combustion

gases in a particular direction for most efficient use in downstream turbine stages. The system of *Albers* is not a seal.

Claims 2, 5-6, 12 and 15-16 depend from claims 1 and 11, which are patentable for the reasons previously set forth. Thus, claims 2, 5-6, 12 and 15-16 are patentable. Furthermore, as discussed in Section II, claims 1 and 11 state that "the plurality of blades extending radially from the stationary body are positioned at an acute angle relative to a rotational axis of the rotatable body in the at least one row of blades that is generally orthogonal to the rotational axis." Claims 1 and 11 also state that "a low pressure gas region in the turbine engine that is proximate to the plurality of blades extending radially from [[a]] the rotatable body and opposite to the plurality of blades extending radially from the stationary body, wherein the low pressure region has a pressure less than the high pressure region." There exists no teaching or suggestion in *Albers*, *Gross* or *Bunker* for the combination of the blades of *Albers* with *Gross* or *Bunker* because the blades of *Albers* are used to redirect fluids flowing downstream of the turbine blade. Combination of these blades with the configurations disclosed in *Gross* and *Bunker* would yield blades on a rotational body with downstream blades on a stationary body for redirecting the downstream flow. The pumping action of the blades on the rotational body would direct fluids upstream and away from the blade of *Albers*.

In stark contrast, the claimed configuration includes blades extending from a stationary structure, wherein the blades are positioned upstream, between the blade on the rotational body and the high pressure region. Thus, in the claimed configuration, blades on

the rotational body direct fluids towards the high pressure region and towards the blades extending from the stationary body. Combination of *Albers*, *Gross* and *Bunker* would not yield the claimed invention because the stationary blades disclosed in *Albers* would not be positioned between the blades extending from the rotational body and the high pressure region. Rather, the stationary blades disclosed in *Albers* would be positioned between the blades extending from the rotational body and the low region. And such a difference would not be obvious to one of ordinary skill in the art to redesign because no such motivation was known in the art and is not disclosed in *Albers*, *Gross* and *Bunker*. Thus, for at least these reasons, amended claims 2, 5-6, 12 and 15-16 are allowable, and the Examiner is respectfully requested to withdraw the rejection.

VIII. CLAIMS APPENDIX

1. A turbine engine having a seal, comprising:

a plurality of blades extending radially from a rotatable body and generally forming at least one row of blades;

a plurality of blades extending radially from a stationary body towards the rotatable body and generally forming at least one row of blades;

a high pressure gas region in the turbine engine that is proximate to the plurality of blades extending radially from the stationary body and opposite to the plurality of blades extending radially from the rotatable body;

a low pressure gas region in the turbine engine that is proximate to the plurality of blades extending radially from the rotatable body and opposite to the plurality of blades extending radially from the stationary body, wherein the low pressure region has a pressure less than the high pressure region;

wherein the plurality of blades extending from the rotatable body and the plurality of blades extending from the stationary body form the seal between the high pressure gas region and the low pressure gas region;

wherein the plurality of blades extending radially from the stationary body are positioned proximate to the plurality of blades extending from the rotatable body and are nonparallel with the plurality of blades extending from the rotatable body, and the plurality of blades extending radially from the stationary body are positioned at an acute angle relative

to a rotational axis of the rotatable body in the at least one row of blades that is generally orthogonal to the rotational axis; and

wherein the plurality of blades coupled to the rotatable body are positioned to direct fluids from the low pressure gas region toward the high pressure gas region to limit leakage of fluids from the high pressure gas region proximate to the at least one row of blades coupled to the stationary body to the low pressure gas region proximate to the at least one row of blades coupled to the rotatable body.

2. The turbine engine having a seal of claim 1, wherein the plurality of blades extending radially from the stationary body are generally orthogonal to the plurality of blades extending from the rotatable body.

3. The turbine engine having a seal of claim 1, wherein the plurality of blades extending radially from the rotatable body are aligned at an angle of between about 1 degree and about 89 degrees relative to a rotational axis of the rotatable body.

4. The turbine engine having a seal of claim 3, wherein the plurality of blades extending radially from the rotatable body are aligned at an angle of about 60 degrees relative to a rotational axis of the rotatable body.

5. The turbine engine having a seal of claim 1, wherein the plurality of blades extending radially from the stationary body are aligned at an angle of between about 1 degree and about 89 degrees relative to a rotational axis of the rotatable body.

6. The turbine engine having a seal of claim 5, wherein the plurality of blades extending radially from the stationary body are aligned at an angle of about 60 degrees relative to a rotational axis of the rotatable body.

7. (Canceled)

8. (Canceled)

9. The turbine engine having a seal of claim 1, wherein the plurality of blades extending radially from the rotatable body extend to within about 0.6 millimeters radially from the stationary body.

10. The turbine engine having a seal of claim 1, wherein the plurality of blades extending radially from the stationary body extend to within about 0.6 millimeters radially from the rotatable body.

11. A turbine engine having a seal, comprising:

a plurality of blades extending radially from a rotatable body and positioned generally nonparallel to a rotational axis of the rotatable body, wherein the plurality of blades generally form at least one row of blades;

a plurality of blades extending radially from a stationary body towards the rotatable body and positioned nonparallel to the rotational axis of the rotatable body, wherein the plurality of blades form at least one row of blades; a high pressure gas region in the turbine engine that is proximate to the plurality of blades extending radially from the stationary body and opposite to the plurality of blades extending radially from the rotatable body;

a low pressure gas region in the turbine engine that is proximate to the plurality of blades extending radially from the rotatable body and opposite to the plurality of blades extending radially from the stationary body, wherein the low pressure region has a pressure less than the high pressure region;

wherein the plurality of blades extending from the rotatable body and the plurality of blades extending from the stationary body form the seal between the high pressure gas region and the low pressure gas region;

wherein the plurality of blades extending radially from the stationary body are positioned proximate to the plurality of blades extending from the rotatable body and are nonparallel with the plurality of blades extending from the rotatable body, and the plurality of blades extending radially from the stationary body are positioned at an acute angle relative to a rotational axis of the rotatable body in the at least one row of blades that is generally orthogonal to the rotational axis; and

wherein the plurality of blades coupled to the rotatable body are positioned to direct fluids from the low pressure gas region toward the high pressure gas region to limit leakage of fluids from the high pressure gas region proximate to the at least one row of blades coupled to the stationary body to the low pressure gas region proximate to the at least one row of blades coupled to the rotatable body.

12. The turbine engine having a seal of claim 11, wherein the plurality of blades extending radially from the stationary body are generally orthogonal to the plurality of blades extending from the rotatable body.

13. The turbine engine having a seal of claim 11, wherein the plurality of blades extending radially from the rotatable body are aligned at an angle of between about 1 degree and about 89 degrees relative to a rotational axis of the rotatable body.

14. The turbine engine having a seal of claim 13, wherein the plurality of blades extending radially from the rotatable body are aligned at an angle of about 60 degrees relative to a rotational axis of the rotatable body.

15. The turbine engine having a seal of claim 11, wherein the plurality of blades extending radially from the stationary body are aligned at an angle of between about 1 degree and about 89 degrees relative to a rotational axis of the rotatable body.

16. The turbine engine having a seal of claim 15, wherein the plurality of blades extending radially from the stationary body are aligned at an angle of about 60 degrees relative to a rotational axis of the rotatable body.

17. (Canceled)

18. (Canceled)

19. The turbine engine having a seal of claim 11, wherein the plurality of blades extending radially from the rotatable body extend to within about 0.6 millimeters radially from the stationary body.

20. The turbine engine having a seal of claim 11, wherein the plurality of blades extending radially from the stationary body extend to within about 0.6 millimeters radially from the rotatable body.

IX. EVIDENCE APPENDIX

None.

X. RELATED PROCEEDINGS APPENDIX

None.

CONCLUSION

For at least the reasons given above, claims 1-6, 9-16, 19 and 20 define patentable subject matter and are thus allowable. The Applicant requests withdrawal of the rejections and allowance of the claims.

Respectfully submitted,



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